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EXAMINER

KLIMOWICZ, WILLIAM JOSEPH

ART UNIT PAPER NUMBER

2627

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,265

Applicant(s)

HIRANO ET AL. 

Examiner

William J. Klimowicz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1).

As per claim 1 and 5, Plotto (US 4,473,855) discloses a disk drive (e.g., see COL. 1, line 16, *et seq.*) and an airflow shroud for a slider, comprising: a frame portion (PROTECT) having an opening suitable for exposing an air bearing surface of a slider (SV) for a disk drive, the frame portion (PROTECT) surrounding the slider (SV); and an attachment portion adapted for attachment to a suspension (SUSP) of a disk drive (e.g., see, *inter alia*, COL. 7, lines 17-21).

Per claim 1 and claim 5, however, Plotto (US 4,473,855) does not expressly disclose a moving-slider-type microactuator coupled to the slider.

Zhang et al. (US 6,396,667 B1) discloses a slider and head suspension of an analogous type disclosed by Plotto (US 4,473,855), but additionally expressly teaches providing a moving-slider-type microactuator (including 66, 64, 176) coupled to a slider (24) for the purpose of providing a small microactuator that advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et. seq.*)

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Given the express teachings and motivations, as espoused by Zhang et al. (US 6,396,667 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Plotto (US 4,473,855).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the moving-slider-type microactuator as taught by Zhang et al. (US 6,396,667 B1), to the slider of Plotto (US 4,473,855) in order to provide a small microactuator that advantageously allows high resolution head positioning (e.g., see, *inter alia*, COL. 1, line 39 *et. seq.*)

Additionally, as per claims 3 and 7, Plotto (US 4,473,855), in combination with Zhang et al. (US 6,396,667 B1), however, remains silent as to the specific relationships set forth in claims 3 and 7, i.e., wherein between about 50 to 100 micrometers of the slider (SV) are exposed through the opening of the frame portion.

Given the teachings of Plotto (US 4,473,855), however, to expressly minimize turbulence effects on the transducer and its associated components, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIG. 5b, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the opening, including the range of “about 50 to 100 micrometers of the slider” in the course of routine optimization/ experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7.

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That is, given the teachings of Plotto (US 4,473,855), however, to expressly minimize turbulence effects on the transducer and its associated components, wherein only a slight portion of the air bearing slider is exposed through the opening as seen in FIG. 5b, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention to provide an approximate range of the slider exposure through the opening, including the range of “about 50 to 100 micrometers of the slider” in the course of routine optimization/ experimentation and thereby obtain various standard optimized relationships including those set forth in claims 3 and 7 in order to protect the majority of the slider from the impinging effects of turbulent air on the slider by providing a minimal exposure of the slider, e.g., “about 3 micrometers,” while also providing sufficient slider shroud protection while allowing enough the of the air bearing surfaces of the slider to provide the desired floating quality, e.g., an upper range of exposure at “about 50 micrometers.” Such a range of slider exposure through the frame opening of “about 50 to 100 micrometers of the slider” is considered to be within the level of ordinary skill in the art, given the teachings and suggestion of Plotto (US 4,473,855).

Additionally, the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found.

It furthermore has been held in such a situation, the Applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

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Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plotto (US 4,473,855) in view of Zhang et al. (US 6,396,667 B1) as applied to claim 1 and claim 5, respectively, above, and further in view of Severson (US 6,549,365 B1).

See the description of Plotto (US 4,473,855) and Zhang et al. (US 6,396,667 B1), *supra*.

As per claims 2 and 6, Plotto (US 4,473,855) does not expressly disclose wherein the frame portion (PROTECT) has side portions forming the opening and a tapered shape between each side portion and the opening.

Severson (US 6,549,365 B1), however, discloses an analogous frame/shroud for diverting air currents directed at the slider, wherein Severson (US 6,549,365 B1) additionally discloses wherein the frame portion has side portions inclusive of a tapered shape between each side portion and the opening. See embodiments of Figures 8-12 of Severson (US 6,549,365 B1).

Given the express teachings and motivations, as espoused by Severson (US 6,549,365 B1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the frame portion of Plotto (US 4,473,855) (in combination with Zhang et al. (US 6,396,667 B1)) as having has side portions inclusive of a tapered shape between each side portion and the opening, as expressly suggested by the embodiments of FIGS. 8-12 of Severson (US 6,549,365 B1).

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The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the frame portion of Plotto (US 4,473,855) (in combination with Zhang et al. (US 6,396,667 B1)) as having side portions inclusive of a tapered shape between each side portion and the opening, as expressly suggested by the embodiments of FIGS. 8-12 of Severson (US 6,549,365 B1) in order to “avoid sharp compression corners and expansion corners in the flow field,” thus minimizing “boundary layer separation and flow instabilities.” See Severson (US 6,549,365 B1) at COL. 6, lines 4-8.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 4 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Shimanouchi et al. (WO 02/097803 A1).

As per claims 4 and 8, discloses a disk drive (11) (FIG. 1) and an airflow shroud (e.g., recessed portion in slider into which microactuator (31) is inserted) for a moving-head-type microactuator, comprising: a plate portion (32) attachable to a slider (19) having a moving-head-type microactuator; and a recessed portion (e.g., recessed portion in slider into which microactuator (31) is inserted) corresponding to the moving-head-type microactuator (31) of the slider (19).

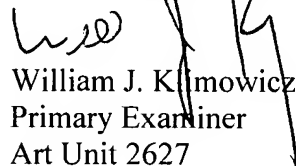
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (571) 272-7577. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William J. Klimowicz
Primary Examiner
Art Unit 2627

WJK